2.6. **Relationship between SST and Convection during the NE monsoon**

There is a strong relationship between SST and atmospheric convection over the tropical ocean basins. Previous studies (Gadgil et al., 1984, Sabin et al., 2012) have shown that during the southwest monsoon season, convection over the Bay of Bengal is initiated when SSTs are between 27^0-28^0C. A similar analysis was made for the NE monsoon season (Oct-Dec) using long term data of SST and Outgoing Long Wave Radiation (OLR) data over the Indian Ocean. OLR is a proxy for atmospheric convection.

Fig. 2.12 d shows the scatter plot between SST and OLR over the a) the Arabian Sea (0-20^0 N, 60-75^0 E) and b) the Bay of Bengal (0-20^0 N, 80-100^0 E). The data during 1982-2021 have been used for these plots. Over the Bay of Bengal, convection starts abruptly and increases sharply once the SST threshold crosses 28.0^0 C. At 28.5^0C, the OLR in the Bay of Bengal is 20 Wm^{-2} lower than in the Arabian Sea due to much deeper clouds over the Bay of Bengal. The mode with the highest probability for SST above the threshold of 28^0C over the Bay of Bengal has low OLR (about 210 Wm^{-2}) corresponding to deep convection whereas that for the Arabian sea it is around 250 Wm^{-2}.

It is interesting to note that even above the SST threshold of 28^0C, there are points with OLR values more than 240 Wm^{-2} suggesting severe convection is not present at these locations. It may be worthwhile to note that only SST threshold will not decide whether convection will occur or not. Initiation of convection also depends on atmospheric circulation, which should be conducive for low level convergence and ascending motion (Lau et al., 1997). This aspect is not further examined here and should be taken up as a separate study.

2.7. **Spatial distribution of cloud properties**

A further analysis was made on the spatial structure of some vital cloud properties during November over the region using the International Satellite Cloud Climatology Product (ISCCP) data (Rossow et al., 1991) for the period 1998-2019. Fig. 2.13 a, b and c show the spatial pattern of Deep convective clouds (DCC) (%), Cloud